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**What's happening to your food? How genetic engineering is changing what's on your plate.**  YOUR ENERGY Milano, Carol.

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Remember the sick feeling the stars of the film The Island got when they realized they were lab-created copies of other people? Genetic engineering isn't just the stuff of science fiction anymore. Today's scientists can mix and match different genes--the material in cells that controls everything from hair color to risk for various diseases. The technology is also being used on the foods that stock supermarket shelves.

Today, researchers transfer genes from various organisms into familiar fruits and vegetables to develop desired traits, such as resistance to pests and insecticides. These carefully manipulated crops include genetically engineered (GE) corn, soybeans, canola, alfalfa, squashes, and papayas. Animals that produce good meat or a lot of milk can also be cloned, using genes from one animal to create an artificial "twin." Critics sometimes call the results of this tinkering "Frankenfoods," after the patched-together creature in Mary Shelley's famous horror novel Frankenstein.

Since their introduction in 1996, GE foods have become abundant throughout the United States. About 89 percent of the soybeans, 61 percent of the corn, and 83 percent of the cotton grown here are genetically engineered. You won't see altered ears of corn in supermarket produce departments, but more than 70 percent of processed foods in the United States include some oil or ingredient from a "biotech" crop. Some taco chips, for instance, contain substantial amounts of GE corn.

Pros and Cons

Developed by universities and private companies, GE crops are regulated by the U.S. Department of Agriculture (USDA). The modified plants "have a wide variety of traits that benefit farmers and consumers," reports Terri Teuber, a USDA spokesperson. "For example, genetically engineered crops can tolerate drought conditions and herbicides, resist insects and viruses, and provide enhanced quality and nutrition for consumers." Critics of GE crops, however, say that many questions haven't yet been answered.

What are GE foods good for?

Some farmers say they like to grow GE crops because the plants need fewer pesticide applications. This could be good for farmworkers, who may suffer pesticide-related health problems, says Marion Nestle, a professor of nutrition at New York University in New York City. And it reduces the chance that insecticides will wind up in the soil or water, potentially making their way into the food system. But it would be better for everyone--workers and consumers--to use no pesticides at all, Nestle adds.

So far, GE foods don't give any other health boost. "No genetically engineered crops on the market today have enhanced nutrition for consumers," declares Jane Rissler, deputy director for food and environmental programs at the Union of Concerned Scientists in Washington, D.C. "Crops created to kill insects or resist weed killers have not been engineered to be healthier for people." Another concern is that tweaking could change nutrient levels, so an orange might have less vitamin C than expected.

Scientists have high hopes for GE foods, however. Some are working on GE peanuts that would be hardier, more nutritious, and less likely to cause allergies than their unaltered cousins. Plus, GE crops might minimize the effects of global warming and drought. Some areas of the world support few crops because of lack of water and other problems, and that can cause starvation. One solution could be planting GE crops designed to need little water; this would provide much-needed nutrition for millions. Nevertheless, points out Gregory Jaffe, director of the Biotechnology Project at the Center for Science in the Public Interest, research is limited because poor countries can't afford the high-tech GE seeds.

What are the safety concerns?

No one has any idea about long-term health effects; after all, these products have been around for only a decade. The U.S. Food and Drug Administration (FDA) doesn't require safety testing of GE foods before they're put on store shelves. Instead, companies are responsible for making sure these foods are safe, and most voluntarily test the products. Companies developing GE foods say they've never caused health problems. However, the food industry isn't sponsoring follow-up research.

Critics once thought altered plants might spread resistance to antibiotics, but technology has changed and that's not a concern anymore. Some people fear that these foods could lead to the development of new allergies; the FDA has strict labeling requirements to protect people with known food allergies. Still, most scientists don't think there will be health problems, according to Jaffe.

Are people worried about GE foods?

Outside the United States, many are wary. People in Europe, for example, want more confirmation that GE foods are safe for humans and the environment. European countries have tougher labeling standards than the United States has, Jaffe says. In addition, he notes, approval of GE products is mandatory before they can enter the European Union's (EU's) food supply. Last summer, some U.S. rice crops were contaminated with an unapproved GE organism. The EU required that all shipments be tested; any tainted rice was rejected. And Japan immediately banned all imports of U.S. rice.

In the United States, though, reactions aren't as strong. Lack of awareness may be one reason: Fewer than half of Americans (48 percent) know that most supermarkets sell GE products, and only 26 percent realize they probably eat the foods every day. Perhaps that's because GE ingredients aren't noted on food labels, so people rarely know they're eating the products. In a recent poll, 34 percent of people thought GE foods were safe, and 29 percent believed they weren't. And though 43 percent think eating food products from clones isn't safe, the FDA has tentatively cleared clone-derived meat and milk for sale.